

ABSTRACT OF THE INVENTION

Conversion coatings comprising a rare earth element and a valence stabilizer combined to form a rare earth/valence stabilizer complex are described for substrate metals. The rare earth element is selected from cerium, praseodymium, terbium, or combinations thereof, and at least one rare earth element is in the tetravalent oxidation state. The coating bath may also contain a preparative or solubility control agent. The oxidized cerium, praseodymium or terbium is present in the coating in a "sparingly soluble" form. The valence stabilizers can be either inorganic or organic in nature. A number of cerium, praseodymium, or terbium/valence stabilizer combinations are presented that can equal the performance of conventional hexavalent chromium systems.